

March 3, 2021

Prince George's County Public Schools
Environmental Safety Office
13306 Old Marlboro Pike
Upper Marlboro, MD 20772

Attention: Alex Baylor
alex.baylor@pgcps.org

Subject: Indoor Air Quality Survey
Walker Mill Middle School
800 Karen Blvd. #3314
Capital Heights, MD 20743

Mr. Baylor:

On January 26, 2021 and February 20, 2021, a Soil and Land Use Technology, Inc. (SaLUT) Industrial Hygienist conducted an indoor air quality (IAQ) evaluation at Walker Mill Middle School, a property maintained by Prince George's County Public Schools (PGCPS) located at 800 Karen Blvd. #3314, Capital Heights, MD 20743. The inspection was performed in accordance with PGCPS contract number IFB 022-19.

Corrective Measures Implemented by PGCPS

On February 20, 2021, as part of this assessment, SaLUT conducted the IAQ evaluation, including IAQ instrumentation screening, and observations in affected areas. Prior to this assessment, in response to an initial assessment, DGS implemented the following corrective measures in the Main Lobby and Room 204:

1. Identify and clearly assess the affected area;
2. Remove and replace moldy and stained ceiling tiles;
3. Thorough cleanup throughout the affected areas;
4. Operate air scrubbers with HEPA filters in the impacted areas;
5. Monitor and evaluate clean-up operation to determine effectiveness

Methodology

The IAQ evaluation conducted by SaLUT included a visual assessment, IAQ instrumentation screening, and a collection of interior air samples for mold in representative locations throughout the building. Additionally, one building exterior environmental air sample was taken for comparison.

Air-borne fungal spore samples were collected on *Air-O-Cell* cassettes using a Buck BioAire calibrated pump. The air samples were taken between three and five feet from the ground. In tandem with collecting mold samples, real-time readings for carbon dioxide, carbon monoxide, temperature and relative humidity were collected using a Fluke 975 Air Meter in representative areas within the facility.

The fungal spore air samples were delivered to EMSL Analytical, Inc. of Beltsville, Maryland for analysis. Fungal spores and particulates in air samples were analyzed by Optical Microscopy (methods EMSL 05-TP-003 and ASTM D7391). The sample chain-of-custody and laboratory reports are attached.

Observations

The table below summarizes the main observations from the IAQ survey at Walker Mill Middle School, visited on January 26, 2021 and February 20, 2021, respectively.

Table 1.1-Observations

Location	Summary of Observations 01-26-2021
Main Lobby	2'x2' ceiling tiles and 3'x 3' tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Main Office	2'x4' ceiling tiles and 12" x 12" tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Multi-Purpose Room	2'x4' ceiling tiles and 12"x12" tile floor; No visual signs of microbial growth, and no odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Gymnasium	2'x4' ceiling tiles; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Easternmost Hallway	2'x4' ceiling tiles and 3'x 3' tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.

Location	Summary of Observations 01-26-2021
Classroom 111	2'x4' ceiling tiles and 12"x12" tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Music Room 113	2'x 4' ceiling tiles and 12"x 12" tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Classroom 116	2'x4' ceiling tiles and 12"x12" tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
2nd floor Room 204	2'x4' ceiling tiles and 12"x12" tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
2nd floor Hallway	2'x4' ceiling tiles and 12"x12" tile floor; No visual signs of microbial growth; Mild odor; No visible dust on floor/other furniture surfaces; No visible dust around ventilator; Central AC.
Outside Exterior EV Sample	Windy

Table 1.2-Observations

Location	Summary of Observations 02-20-2021
Main Lobby	2'x4' ceiling tiles and 1'x1' tile floor; No visual signs of microbial growth, and no odor; Stained ceiling tiles were replaced.
Room 204	2'x4' ceiling tiles and 1'x1' tile floor; No visual signs of microbial growth, and no odor; Stained ceiling tiles were replaced.
Outside Exterior EV Sample	Sunny, windy, chilly and clear sky

Measurements of Indoor Environmental Quality Parameters

Table 2 depicts a summary of average measurements of comfort.

Temperature

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have published recommendations for year round acceptable temperatures in Standard 55-2010 *Thermal Environmental Conditions for Human Occupancy*. The winter comfort range is 20 to 24°C (68 to 75°F) and 23 to 26°C (73 to 79°F) is the summer comfort range. The temperature readings were lower than the ASHRAE recommended ranges in the Main Lobby, the Main Office, the Gymnasium, Classroom 116 and the 2nd floor Room 204.

Relative Humidity (RH)

RH is a key factor for mold growth. Mold has the potential of growing on suitable surfaces with humidity levels above 60%. ASHRAE Standard 62.1-2010 *Ventilation for Acceptable Indoor Air Quality* recommends a maximum indoor RH of 65% to preclude the likelihood of condensation on cool surfaces encouraging mold growth. The RH readings were within the ASHRAE recommended ranges in the representative areas.

Carbon Dioxide (CO₂)

Under conditions of maximum occupancy, ASHRAE Standard 62.1-2010, Appendix C, infers that the acceptable CO₂ upper limit is the prevailing outdoor CO₂ concentration plus 700 parts per million (ppm). On January 26, 2021, the outdoor (building exterior) CO₂ concentration was approximately 414 ppm therefore indoor concentrations should not exceed approximately 1,114 ppm (700 + 414). The maximum average interior CO₂ concentration detected was 496 ppm in the Main Office, a range within the ASHRAE recommendations, per Table 2.1 below.

Carbon Monoxide (CO)

CO is a colorless and odorless gas that is produced by the incomplete combustion of carbon containing fuels. Oil, gasoline, diesel fuels, wood, coke, and coal are major sources of CO. All registered CO concentrations were below the EPA National Ambient Air Quality Standard (NAAQS) of 9 ppm, per Table 2.1 below.

**Table 2.1: Walker Mill Middle School - Instrumental Screening Levels
January 26, 2021 (9:30 AM-11:30 AM)**

Sample Location	Temp °F	RH%	CO ppm	CO ₂ ppm
Standards	ASHRAE 68 to 75°F*	ASHRAE <65%	NAAQS 9	ASHRAE 1,114
Main Lobby	59.0	38.2	0	491
Main Office	60.8	35.2	0	496
Multi-Purpose Room	72.5	25.9	0	459
Gymnasium	65.3	29.6	0	434
Easternmost Hallway	68.0	28.9	0	438
Classroom 111	67.1	28.8	0	444
Music Room 113	68.9	28.1	0	450
Classroom 116	66.2	29.5	0	438
2nd floor Room 204	48.0	28.5	0	453
2nd floor Hallway	68.0	28.6	0	442
Outside Exterior EV Sample	47.3	52.8	0	414

**Table 2.2: Walker Mill Middle School - Instrumental Screening Levels
February 20, 2021 (9:30 AM-11:30 AM)**

Sample Location Standards	Temp °F	RH%	CO ppm	CO ₂ ppm
Standards	ASHRAE 68 to 75°F*	ASHRAE <65%	NAAQS 9	ASHRAE 1,127
Main Lobby	59.0	20.7	0	537
2nd floor Room 204	62.6	19.7	0	469
Outside Exterior EV Sample	46.5	27.6	0	526

PM - Particulate Matter size
°F - Degrees Fahrenheit
CO - Carbon Monoxide
ppm - parts per million

µg/m³ - micrograms per cubic meter
RH% - % Relative Humidity
CO₂ - Carbon Dioxide
* - Winter Comfort Range

Mold-in-Air Samples

There are no definitive regulations or standardized guidelines for addressing airborne mold in an indoor setting. If building systems (ventilation, envelope) are functioning properly, the indoor population profile should mimic what is encountered outdoors and the concentrations should be below the outdoor (building exterior) environmental sample levels.

Table 3.1: Summarizes airborne mold spore sampling results and locations. On January 26, 2021, total mold counts in representative samples (spore count/m³ of air) in all the areas inspected were lower than the outdoor concentrations with the exception of the Main Lobby and the 2nd floor Room 204. Laboratory analysis follows this report (see attachment).

Furthermore, **Table 3.2:** Summarizes airborne mold spore sampling results and locations. On February 20, 2021, total mold counts in representative samples (spore count/m³ of

air) in all the areas inspected were lower than the outdoor concentrations with the exception of the Main Lobby. Laboratory analysis follows this report (see attachment).

**Table 3.1: Walker Mill Middle School
Measurements of Mold-in-Air Samples
January 26, 2021 (9:30 AM-11:30 AM)**

Spore Types	Classroom 111	Classroom 116	Music Room 113	Main Lobby	Main Office	Multi-Purpose Room
<i>Alternaria (Ulocladium)</i>	-	-	-	-	-	-
<i>Ascospores</i>	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i>	-	-	-	200	-	-
<i>Basidiospores</i>	40	-	-	100	-	-
<i>Bipolaris++</i>	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-
<i>Cladosporium</i>	-	-	-	100	-	-
<i>Curvularia</i>	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-
<i>Fusarium</i>	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-	-
<i>Myxomycetes++</i>	-	-	-	-	-	-
<i>Pithomyces++</i>	-	-	-	-	-	-
<i>Rust</i>	-	-	-	-	-	-
<i>Scopulariopsis/Microascus</i>	-	-	-	-	-	-
<i>Stachybotrys/Memmoniella</i>	-	-	-	-	-	-
<i>Unidentifiable Spores</i>	-	-	-	-	-	-
<i>Zygomycetes</i>	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-
<i>Hyphal Fragment</i>	-	-	-	-	-	-
<i>Insect Fragment</i>	-	-	-	-	-	-
<i>Pollen</i>	-	-	-	-	-	-
Total Fungi	40	None Detect	None Detect	400	None Detect	None Detect

* Spore Counts per cubic meter of air (Counts/m³).

++Includes other spores with similar morphology.

**Table 3.1: Walker Mill Middle School
Measurements of Mold-in-Air Samples continued
January 26, 2021 (9:30 AM-11:30 AM)**

Spore Types	Gym-nasium	Eastern-most Hallway	2nd floor Room 204	2nd floor Hallway	Outside Exterior EV Sample	Field Blank
<i>Alternaria (Ulocladium)</i>	-	-	-	-	-	-
<i>Ascospores</i>	-	-	-	-	-	-
<i>Aspergillus/Penicillium</i>	-	-	9,600	40	90	-
<i>Basidiospores</i>	-	-	-	-	40	-
<i>Bipolaris++</i>	-	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-	-
<i>Cladosporium</i>	-	-	-	-	-	-
<i>Curoularia</i>	-	-	-	-	-	-
<i>Epicoccum</i>	-	-	-	-	-	-
<i>Fusarium</i>	-	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	40	-	-
<i>Myxomycetes++</i>	-	-	-	-	-	-
<i>Pithomyces++</i>	-	-	-	-	-	-
<i>Rust</i>	-	-	-	-	-	-
<i>Scopulariopsis/Microascus</i>	-	-	-	-	-	-
<i>Stachybotrys/Memmoniella</i>	-	-	-	-	-	-
<i>Unidentifiable Spores</i>	-	-	-	-	-	-
<i>Zygomycetes</i>	-	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-	-
<i>Hyphal Fragment</i>	-	-	-	-	-	-
<i>Insect Fragment</i>	-	-	-	-	-	-
<i>Pollen</i>	-	-	-	-	-	-
Total Fungi	None Detect	None Detect	9,600	80	130	-

*Spore Counts per cubic meter of air (Counts/m³).

++Includes other spores with similar morphology.

**Table 3.2: Walker Mill Middle School
Measurements of Mold-in-Air Samples continued
February 20, 2021 (9:30 AM-11:30 AM)**

Spore Types	2nd floor Room 204	Main Lobby	Outside Exterior EV Sample	Field Blank	
<i>Alternaria (Ulocladium)</i>	-	-	-	-	-
<i>Ascospores</i>	-	-	-	-	-
<i>Aspergillus/Penicillium</i>	-	100	40	-	-
<i>Basidiospores</i>	-	40	-	-	-
<i>Bipolaris++</i>	-	-	-	-	-
<i>Chaetomium</i>	-	-	-	-	-
<i>Cladosporium</i>	-	90	-	-	-
<i>Curvularia</i>	-	-	-	-	-
<i>Epicoccum</i>	-	-	10*	-	-
<i>Fusarium</i>	-	-	-	-	-
<i>Ganoderma</i>	-	-	-	-	-
<i>Myxomycetes++</i>	-	-	-	-	-
<i>Pithomyces++</i>	-	-	-	-	-
<i>Rust</i>	-	-	-	-	-
<i>Scopulariopsis/Microascus</i>	-	-	-	-	-
<i>Stachybotrys/Memnoniella</i>	-	-	-	-	-
<i>Unidentifiable Spores</i>	-	-	-	-	-
<i>Zygomycetes</i>	-	-	-	-	-
<i>Nigrospora</i>	-	-	-	-	-
<i>Hyphal Fragment</i>	40	40	-	-	-
<i>Insect Fragment</i>	-	-	-	-	-
<i>Pollen</i>	-	-	-	-	-
Total Fungi	40	270	50	None Detect	-

Findings and Conclusions

The comfort parameters (i.e., temperature, RH, CO₂, and CO levels) in the representative areas conform to ASHRAE and/or NAAQS guidelines with the exception of the temperature in the Main Lobby, the Main Office, the Gymnasium, Classroom 116 and the 2nd floor Room 204. On January 26, 2021 total mold counts in representative area samples (spore count/m³ of air) in all the areas inspected were lower than the outdoor concentrations with the exception of the Main Lobby and the 2nd floor Room 204, indicating amplified mold growth.

On February 20, 2021, total mold counts in air samples (spore count/m³ of air) in the Main Lobby and the 2nd floor Room 204 were significantly lower than the outdoor concentrations, indicating no amplified mold growth. Based on the observations, mold

spore results, and the results of the indoor air quality parameters tested, the corrective actions implemented were determined to be effective.

Thank you for the opportunity to provide industrial hygiene services for PGCPS. If you have any questions, please contact me at 301.595.3783.

Sincerely,

Chaminda Jayatilake, PE, CIH, CSP, CHMM
Certified Industrial Hygienist
Soil and Land Use Technology Inc. (SaLUT)

Attachment

Attachment - Mold Spore Sample Analytical Results and Chain-of-Custody Forms

Attachment

Mold Spore Sample Analytical Results and Chain-of-Custody Forms